

April 17, 1986

CD-86-07 (HDE/HDV)

Dear Manufacturer:

Subject: Instructions for Heavy-Duty Engine and Vehicle
Certification

Enclosed are instructions for the preparation and submission of applications for certificates of conformity for 1987 model year heavy-duty engines and vehicles. The use of these instructions is optional. Any application which includes all of the necessary information will be accepted.

The enclosed instructions are applicable to:

(a) Diesel heavy-duty engines which are certified to the exhaust emission standards of 40 CFR 86.085-11

(b) Gasoline-fueled heavy-duty engines that are certified to the exhaust emission standards of 40 CFR 86.087-10

(c) Gasoline-fueled heavy-duty vehicles that are certified to the evaporative emission standards of 40 CFR 86.087-10

(d) Heavy-duty vehicles that are certified to the light-duty truck exhaust and evaporative standards of 40 CFR 86.087-9 under the provisions of 40 CFR 86.085-1(b).

This universal applicability is made possible by the inclusion of specific guidance regarding compliance with requirements that are unique to each of the above four different types of certification programs. This special guidance covers:

(a) Evaporative family information

(b) Statements of compliance

(c) Standardized family names

(d) Certificate of conformity information

The portions of the enclosed instructions that are applicable to heavy-duty engines and gasoline-fueled heavy-duty vehicles

are essentially identical to the separate instructions that were provided for pre-1987 model year engines and vehicles.

The only significant change is the modification of the Certification Information Sheets for heavy-duty engines. The sheet for gasoline-fueled engines was modified to make it applicable to the 1987 model year exhaust emission standards which are related to gross vehicle weight rating. The sheet for diesel engines was modified to make it applicable to the 1988 model year particulate standards.

The portions of the enclosed instructions that are applicable to heavy-duty vehicles that are certified in accordance with the provisions of 40 CFR 86.085-1(b) are new. Such instructions were not provided for prior model years because no vehicles were certified under this option.

The enclosed instructions do not specify the submission of all of the information and data that are specified in 40 CFR, Part 86, Subparts A, I, M, N, and P. The information which is not requested in the instructions must be maintained in the applicant's files to be provided to EPA upon the receipt of a specific request.

The information which is requested in these instructions and submitted in the application must be kept up-to-date during the associated production period by the submission of the appropriate revised pages.

Any questions, comments, or suggestions regarding these instructions should be directed to Mr. J. Bozek (313) 668-4292 or Mr. T. Snyder (313) 668-4376.

Sincerely yours,

Robert E. Maxwell, Director
Certification Division
Office of Mobile Sources

Enclosure

INSTRUCTIONS
FOR THE
PREPARATION AND SUBMISSION
OF
APPLICATIONS FOR CERTIFICATES OF CONFORMITY
FOR
1987 MODEL YEAR HEAVY-DUTY ENGINES AND VEHICLES

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Issue Date: April 17, 1986

CB# 5387b

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CHAPTER 1

Introduction

These instructions provide guidance regarding the preparation, submission, and revision of applications for 1987 model year heavy-duty engine and vehicle certificates of conformity. The instructions include (a) detailed specifications regarding the information which must be provided to document compliance with the applicable standards and (b) suggestions regarding the organization and submission of the required information. The instructions are applicable to:

Gasoline-fueled heavy-duty engines

Diesel heavy-duty engines

Gasoline-fueled heavy-duty vehicles

Heavy-duty vehicles certified in accordance with the light-duty truck procedures per 40 CFR 86.085-1(b).

Heavy-duty engines certified in accordance with the small volume manufacturers procedure per 40 CFR 86.084-14.

The instructions are universally applicable with the following exceptions:

1. Two different evaporative emission family information formats are specified for Section 9 of the application; one for compliance with heavy-duty vehicle standards and one for compliance with the light-duty truck standards under the provisions of 40 CFR 86.085-1(b).

2. Three different requirements are specified for the submission of the statements that are required by the regulations. In addition to the general statements, specific statements are

specified in connection with the certification of (a) gasoline-fueled heavy-duty vehicles to the evaporative emission standards, (b) heavy-duty vehicles in accordance with the light-duty truck provisions of 40 CFR 86.085-1(b), and (c) gasoline-fueled heavy-duty engines in accordance with the 5 percent provisions of 40 CFR 86.087-10(a)(3)(i).

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3. Three different procedures are specified in the Appendix for determining standardized family names, one for heavy-duty engines, one for gasoline-fueled heavy-duty vehicles which are certified to the heavy-duty evaporative emission standards, and one for heavy-duty vehicles which are certified in accordance with the light-duty truck provisions of 40 CFR 86.085-1(b).

4. Four different Certification Information Sheets are specified in the Appendix; one for diesel heavy-duty engines, one for gasoline-fueled heavy-duty engines, one for gasoline-fueled heavy-duty vehicles, and for heavy-duty vehicles which are certified under the 40 CFR 86.085-1(b) light-duty truck option

The preparation of applications by manufacturers who request and receive approval for the use of the small-volume manufacturers certification procedure is specifically addressed in Chapter 4 of the instructions.

An application which is prepared in accordance with these instructions is EPA's principal source of information regarding the product line which is to be certified. This information provides the primary basis for the determination of compliance with emission control regulations. Therefore, the application must be complete and accurate when it is submitted. After it is submitted, it needs to be kept current by the submission of the necessary updating material.

The information specified in these instructions does not include all of the data and records which are specified in 40 CFR, Part 86. The material which is not specified in the instructions must be retained in the applicant's files to be provided to EPA upon the receipt of a specific request

General Instructions

This chapter provides general instructions regarding the preparation, submission, and revision of an application.

2.1 Letter of Intent

The 2.1 Letter of Intent application for a certificate of conformity is not submitted until all phases of the certification program, including all testing, have been completed. This protocol impairs EPA's ability to set up schedules and formulate plans which will help facilitate a timely response to the applicant's requests for assistance and approval. Therefore, the applicant is encouraged to submit a letter of intent to EPA before the application is submitted. The basic information relating to each engine or evaporative emission family to be certified, such as the identifying family name, the anticipated date when the request for a certificate will be submitted, and the Job 1 date should be submitted as soon as possible. The inclusion of any other general information, is recommended. The submittal of such a letter of intent should not be delayed until all information is completely finalized. Best estimates, when finalized data are not available, can be used. However, if significant changes in the anticipated certification program, such as the deletion or addition of an engine or evaporative emission family, are made after the submission of a letter of intent, a letter which updates the previously submitted information should be forwarded to EPA.

2.2 Terminology

Certain terms contained in the instructions have unique connotations, as defined in 40 CFR Part 86, to assist applicants in meeting EPA's requirements for information.

2.3 Structure of the Application

The recommended structure of the application for certification is divided into the following sections:

1. Communications
2. Statement of Confidentiality
3. [Reserved]
4. [Reserved]
5. [Reserved]
6. Maintenance and Warranty
7. Labeling
8. General Technical Description
9. Evaporative Emission Family Description
10. Engine Family Descriptions
11. [Reserved]
12. Test Engine or Vehicle Information
13. [Reserved]
14. [Reserved]
15. [Reserved]
16. Request for Certificate

Chapter 3 of these instructions specifies the precise contents of each of these sections.

The division of the application into sections reflects the fact that the elements of information within the application vary widely in their relevance and applicability to the applicant's product line or certification program as a whole. The data required by Section 10 (Engine Family Descriptions), for example applies to a single engine family; a description of a carburetor in Section 8 (General Technical Description) would pertain to all engines and engine family/exhaust emission control system combinations that would be equipped with that carburetor during a particular model year; the discussion of Maintenance and Warranty (Section 6) would apply to the applicant's entire certification program and product line for one model year. The suggested format groups together in Sections 1 through 8 the "general" information that applies broadly to the entire product line or certification effort; Sections 9 through 15 provide information which are specific to particular test engines or vehicles and engine or evaporative families; Section 16 is a summary of the data required to substantiate that the new engines or vehicles comply with Federal emission standards (Ref: 40 CFR 86.085-9, 10 and 11).

2.4 Size and Form of the Application

All applications must be presented in the English language on 8-1/2 inch by 11 inch paper, or a reasonable equivalent, and be

bound in a loose-leaf cover of the same approximate size. Divider pages should be used to separate the recommended application sections from one another.

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2.5 Referencing

Referencing permits a reduction in the size of the application by minimizing duplication and redundancy. In many of the applications that were submitted in previous model years, identical information which was applicable to several engine families was reproduced in several different places. "Referencing" makes use of a single description to cover all instances within the application where that information may be necessary to eliminate such needless repetition.

Applicants are encouraged to reduce duplication by referring to the location of a unit of information's first submission whenever access to that information is required, rather than needlessly reproducing identical data. In essence, the concept of referencing reduces paperwork by encouraging the applicant to submit a unit of information only once for each model year. Referencing across model years is not allowed with the exception that applicants may reference Test Engine Information, Section 12, across model Years. The applicant must have submitted Section 12 in a separate binder in order to reference across model years.

Applicants should be wary, however, of applying the referencing concept too freely and producing an application whose every page is a bewildering network of allusions to other pages of the application. Such overuse of referencing would generate a document that, although free of repetition, could not be reviewed without large amounts of inefficient crosschecking and page-turning. Applicants should consequently exercise good judgment to prevent taking the referencing concept to unproductive extremes.

2.6 Page Numbering

Each page number should include the respective section number, e.g., 02-2 (section 02.00.00.00 -page 2), 08.01.01-15 (section 08.01.01.00 -page 15), 05.01-9 (section 05.01.00.00 - page 9). The detail of the indexing system which is used in page

numbering should be based upon the amount of information contained in a given section. In section 02.00.00.00, there is not a large enough volume of information to support a finer breakdown; however, in section 08.01.00.00 there may be many pages of carburetor description as well as fuel injection description so it may be appropriate to use three levels of indexing in the page number (even four may be appropriate if there are a number of carburetors to describe). It is up to the applicant to decide what type of detail is appropriate for his application. Some provision, such as the use of decimal numbers, should be made for adding a new page with new or supplemental data without disturbing the numbering of the other pages in a particular section, e.g., 02-2.1.

For sections that are specific to a particular engine family (e.g., 10.00.00.00, 16.00.00.00), the page numbering system should include the name of the appropriate engine family to avoid confusion in handling many pages of similar format, e.g., 10-GHC0466EPAX (for engine family GHC0466EPAX). For purposes of page numbering, the standardized engine family name (see Appendix pages 1-10) may be abbreviated by deleting the model year and manufacturer characters, which would be common to all of a manufacturer's engine families for a given model year, and the check-sum digit, e.g., 10-466EPA-2. Further abbreviation is permissible as long as the resulting designation is sufficient to identify the engine family uniquely within the application. If displacement and the "uniqueness digits" constitute a distinctive abbreviation for the family name, for instance, then 10-466A would be an adequate page number. Applicants who wish to use abbreviated family names shorter than seven characters should clearly indicate on the divider page that precedes the engine family information the abbreviation to be used; all such abbreviations should be summarized in a table at the beginning of Section 10.00.00.00.

2.7 Indexing

The format recommended in these instructions assigns a unique eight-digit code to every element or unit of certification data contained within the application. Each code consists of four two-digit pairs, such as 10.03.01.03, with each successive pair

indicating a more precise and specific level of description. Hence, in this example, the 10 refers to engine family descriptions; the 03 refers to the fuel system (one of the individual engine parameters); the 01 refers to carburetor; and the 03 refers to calibration.

The table on pages 7 and 8 sets forth all codes which can be used within an application for certification. Some of these codes include two-digit pairs whose value is double zero (00, as in Carburetors--08.01.01.00). The presence of the double zero pair indicates that one available level of the indexing scheme has not been assigned by EPA. Designations at this level can and should be assigned by applicants, however, if distinctions at this level of precision need to be drawn. If an applicant needs to provide general technical descriptions of two kinds of carburetors, for example, the pertinent sections of the application could be labeled 08.01.01.01 and 08.01.01.02.

All submissions of certification data, should be structured according to the indexing order outlined below. Page numbers should also reflect this order, as is specified in Subpart 6 of this Chapter on page numbering. It is not strictly necessary to tag information within the pages of the application with their corresponding codes, if it is always clear what kind or element of data is being presented or described.

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Section No.	Title
01.00.00.00	COMMUNICATIONS
.01 00.00	Mailing Information
01.00	Technical Representatives
02.00	Advisory Circulars and Other Technical Information
03.00	Certificate of Conformity
02.00.00.00	STATEMENT OF CONFIDENTIALITY
03.00.00.00	RESERVED
04.00.00.00	RESERVED
05.00.00.00	RESERVED

- 06.00.00.00 MAINTENANCE AND WARRANTY
 - .01.00.00 Owner's Manuals
 - .02.00.00 Shop Manuals
 - .03.00.00 Technical Service Bulletins
 - .04 00.00 Emission System Warranty Statement

- 07.00.00.00 LABELING
 - .01.00.00 Engines
 - .02.00.00 Vehicles

- 08.00.00.00 GENERAL TECHNICAL DESCRIPTION
 - .01.00.00 Engine Systems
 - .01.00 Fuel Systems
 - .01 Carburetor
 - .02 Fuel Injection
 - .02.00 Ignition System
 - .03.00 Superchargers or Turbochargers
 - .04.00 Emission Control Systems
 - .01 Crankcase
 - .02 Engine Modification
 - .03 Air Injection
 - .04 Exhaust Gas Recirculation
 - .05 Catalyst
 - .06 Smoke-Puff-Limiter
 - .07 Other
 - .05.00 Auxiliary Emission Control Devices
 - .06.00 Emission Control Warning Devices

 - .02.00.00 Evaporative Systems
 - .01.00 Fuel Tank
 - .02.00 Storage Device
 - .03.00 Purge System
 - .04.00 Carburetor
 - .05.00 Air Cleaner
 - .06.00 Auxiliary Emission Control Devices
 - .07.00 Evaporative Control System Configuration

- 09.00.00.00 EVAPORATIVE EMISSION FAMILY DESCRIPTIONS
 (See Chapter 3 for details regarding
 the preparation of this section of the
 application).

- 10.00.00.00 ENGINE FAMILY DESCRIPTIONS

(See Chapter 3 for details regarding the preparation of this section of the application).

- 11.00.00.00 RESERVED
- 12.00.00.00 TEST ENGINE OR VEHICLE INFORMATION
 - .01.00.00 Zero Hour or Mile Validation Data
 - .02.00.00 Emission Test Results
 - .03.00.00 Maintenance Information
 - .04.00.00 Engineering Reports
- 13.00.00.00 RESERVED
- 14.00.00.00 RESERVED
- 15.00.00.00 RESERVED
- 16.00.00.00 REQUEST FOR CERTIFICATE
 - .01.00.00 Statements
 - .02.00.00 Deterioration Factor Summary
 - .03.00.00 Certification Information
 - .04.00.00 Production Part Numbers
 - .05.00.00 Production Parameters

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2.8 Standardized Family Names

Applicants are required to use the standardized engine and/or evaporative family name format which is illustrated on Appendix pages 1 through 7.

2.9 Submitting the Application

Submission of the application is made after testing is completed and the application is in final form. One copy should be forwarded with a letter of transmittal to:

Director Certification Division
Office of Mobile Sources
U.S. Environmental Protection Agency
2565 Plymouth Road
Ann Arbor, Michigan 48105

A duplicate copy of the application should be forwarded to:

Director (EN-340)
Manufacturers Operations Division
U.S. Environmental Protection Agency
401 M Street, S. W.
Washington, D. C. 20460

2.10 Revising the Application

After the application has been submitted, revisions may become necessary. The material which needs to be submitted depends upon whether or not a revision involves a product line change that may have an effect on emissions.

If a revision merely corrects an error or omission and does not involve a product line change which may have an affect on emissions, only a brief description or explanation of the revision and the revised application pages are submitted.

If a revision involves a product line change which may have an affect on emissions, a Certificate Change Request must be submitted along with a description of the revision and the revised application pages.

Many applicants in the past have followed a practice of identifying successive running changes with a number which includes the family designation and model year of the vehicle being affected. (For example, the number of the first running change in the 1987 model year for the ABC family might be 87-ABC-01.) This practice has proved to be quite useful and is highly recommended.

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Each page of the application should include a revision block which provides space for the date of issue as well as the effective date of each revision.

Revision No.:
Revision Date:

CHAPTER 3

Preparing the Application

This chapter presents recommendations for preparing the sections of the application for certification in a manner that will ensure that the needs of EPA will be met. Careful adherence to these recommendations and the submission of all required data will greatly expedite the review process.

3.1 Communications (Section 01.00.00.00)

This section of the application should contain information concerning:

(a) Routine Communications

The names, addresses, and telephone numbers of all technical representatives who are authorized to communicate with EPA should be provided.

(b) Receipt of Advisory Circulars and Other Technical Information

The name and address of the representative who is to receive the information should be provided. If the information is normally received through some organization (e.g., Engine Manufacturers Association), that fact should be noted so unnecessary duplicate distribution can be avoided. If the information is to be picked up by couriers rather than mailed, this fact should be noted.

(c) Receipt of Certificates of Conformity

The name and address of the representative who is to receive the certificate should be provided.

At the beginning of the model year certification program EPA will assume that the Communications information provided in the applicant's previous model year application for certification is still applicable. To assure EPA's continued ability to communicate without inconvenience or delay, the applicant should keep EPA informed of any substantive change that may occur to the Communications information prior to the submission of the application for certification. If the applicant has not previously applied for a certificate, the communication information should be submitted as soon as possible, preferably well in advance of the submission of the application.

3.2 Statement of Business Confidentiality (Section 02.00.00.00)

Section 208(b) of the Clean Air Act requires (1) the Administrator to disclose to the public all non-trade secret information and keep trade secret information confidential and (2) the person who has submitted the information claimed to be confidential to make a satisfactory showing that the information in question would divulge trade secrets, if disclosed. If an applicant fails to make a claim the information in the application may be made available to the public without further notice to the applicant.

Confidentiality claims and substantiating information are to be included with the data for which confidential status is requested at the time of submission to EPA. For information for which confidential treatment is desired, the following questions need to be addressed:

1. Which information in the application for certification is considered to be entitled to confidential treatment until model introduction?

2. Which information in the application for certification is considered to be entitled to continuing confidential treatment after model introduction?

3. To what extent has the information been disclosed to others and what precautions were taken with respect to these disclosures?

4. Is the information available to the public through legitimate means?

5. Can the information be derived from a detailed engineering

inspection of the motor vehicle model in question or from information already public once the model is offered for public sale?

6. Would disclosure of the information be likely to result in substantial harm to the applicants competitive position? If so, a detailed discussion regarding what the harmful effects would be, why the effects would be substantial, and the nature of the casual relationship between disclosure and the harmful effects must be presented.

Complete answers to these questions must be supplied for all information which is claimed to be confidential. The EPA General Counsel will make a final determination on the claim partly on the supporting data which are provided.

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Information which is submitted in substantiation of a confidentiality claim may be claimed to be confidential in its own right. If the information pertains to the confidentiality claim, is not otherwise possessed by EPA, and is marked, when received by EPA, as "trade secret," "proprietary," or "company confidential," it will not be disclosed by EPA without the applicant's consent unless disclosure is ordered by a Federal court. If no claim accompanies this substantiation information when it is received by EPA, it may be made available to the public without further notice to the applicant.

To facilitate reproduction for release purposes, trade secrets should not be included on the same page as information which is available for public release. Also pages containing trade secret information should be clearly identified as "TRADE SECRET," "PROPRIETARY," or "CONFIDENTIAL."

3.3 Reserved (Section 03.00.00.00)

3.4 Reserved (Section 04.00.00.00)

3.5 Reserved (Section 05.00.00.00)

3.6 Maintenance and Warranty (Section 06.00.00.00)

The manufacturer shall submit at the time of issuance copies of all instructions or explanations regarding the use, repair, adjustment, maintenance, or testing of an engine or vehicle relevant to the control of crankcase, exhaust, or evaporative emissions issued by the manufacturer for use by other manufacturers, assembly plants, distributors, dealers, and ultimate purchasers. This requirement can be met by forwarding to EPA shop maintenance manuals, technical service bulletins, and vehicle owner's manuals. [Ref: 40 CFR 86.078-7(b)]

In addition to this information, the emission system warranty which will be provided to the ultimate purchaser is to be submitted to EPA.

3.7 Label Format (Section 07.00.00.00)

A copy of each label (either the actual label, a photograph, or a drawing) to be used to comply with 40 CFR 86.087-35 must be submitted. A photograph or a written description of the location of the label on the engine or vehicle for each model certified must also be submitted.

3.8 General Technical Description (Section 08.00.00.00)

This section should be a reference book for Sections 9.00.00.00 and 10.00.00.00. Whenever an explanation greater than a few words or a line is required in this section, a narrative explanation should be contained in Section 08.00.00.00. Similarly, whenever the configuration of a component needs to be shown, the drawing or schematic can be presented in Section 08.00.00.00.

Information, such as an emission control system feature (Sec. 10.07.02.00), which does not differ within or among engine families, will appropriately be listed in Section 08.04.00.00 and then referenced for each family to eliminate duplication.

3.9 Evaporative Emission Family Description (Section 09.00.00.00)

The information submitted determines how the applicant's product line is subdivided into separate evaporative families.

When an application includes a number of evaporative families which share common characteristics, referencing should be used to avoid the submission of redundant information. The submission of much of this information may be eliminated by referencing a particular evaporative emission family. For example, if manufacturer wishes to certify families A, B, and C, each of which differ by one or more parameters, the applicant can submit all the required information on evaporative emission family A and then submit a single page for evaporative emission families B and C with a statement stating that these families are identical to evaporative emission family A except for the listed differences.

This concept can be enlarged where certain sections of an evaporative emission family may be different but would benefit from the use of referencing. Discretion will have to be used, however, to ensure that this procedure is used in cases where there are few enough differences to make it an effective tool.

The evaporative emission family description required information is divided into two sections:

I. Heavy-duty vehicles - This is the standard evaporative certification procedures and standards.

II. Heavy-duty vehicles certified under the provisions of 40 CFR 86.085-1(b) - This is the optional procedure for heavy-duty vehicles under 10,000 pounds GVWR.

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I -HEAVY-DUTY VEHICLES

Section No.	Title
09.01.00.00	Common family parameters
.01.00	Method of fuel air metering (i.e., carburetion versus fuel injection)
.02.00	Carburetor bowl fuel volume
.02.00.00	Common control system parameters
.01.00	Method of vapor storage
.02.00	Method of carburetor sealing
.03.00	Method of air cleaner sealing

- .04.00 Vapor storage working capacity
- .05.00 Number of storage devices
- .06.00 Method of purging stored vapor
- .07.00 Method of venting the carburetor
- .08.00 Liquid fuel hose material
- .09.00 Vapor storage material
- .03.00.00 Individual control system parameters
 - .01.00 Fuel Tank
 - .01 Maximum nominal fuel tank capacity
 - .02 Description (include filler inlet, cap, relief valve, vents, and anything contained in-tank)
 - .03 Calibration of any device on fuel tank such as vents or pressure relief valves
 - .04 Fuel tank material
 - .02.00 Storage device
 - .01 Description
 - .02 Calibration
 - .03.00 Purge-system
 - .01 Description
 - .02 Calibration
 - .04.00 Carburetor
 - .01 Description
 - .02 Calibration
 - .05.00 Air cleaner
 - .01 Description
 - .06.00 Auxiliary Emission Control Devices
 - .01 Descriptions
 - .02 Calibrations
 - .07.00 Total evaporative emission system configuration (include any environmental control mechanisms such as underhood fans)
 - .08.00 Gross vehicle weight rating for the evaporative control system (maximum/minimum)

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II -HEAVY-DUTY VEHICLES CERTIFIED UNDER THE PROVISIONS OF 40 CFR 86.085-1(b)

Section No.	Title
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- 09.01.00.00 Common Family Parameters
 - 01.00 Vapor storage device (e.g., canister, crankcase, air cleaner)
 - .02.00 Basic canister design
 - .01 Working capacity
 - .02 Housing material (e.g., plastic, steel)
 - .03 Configuration (e.g., closed bottom, open bottom, vent mechanism, purge control)
 - 03.00 Fuel system (Carbureted)
 - .01 Number of carburetors
 - .02 Carburetor description
 - .04.00 Fuel system (Fuel injection)
 - .01 Type (e.g., mechanical, electronic)
 - .02 Flow control (continuous, timed)
- .02.00.00 Common control system parameters
 - .01.00 Method of vapor storage control
 - .02.00 Canister absorption material (carbon or synthetic)
 - .03.00 Purge techniques
 - .01 Controlled (Yes or No) If controlled, give method
 - .02 Point of induction (e.g., PCV, air cleaner, carburetor)
 - .03 Conditioning of purge air (e.g., heated, dried)
 - .04.00 Fuel system environment control (e.g., thermostatically controlled, forced cooling of the fuel system)
 - .05.00 Fuel filler cap
 - .01 Sealing mechanism
 - .02 Retention mechanism
- .03.00.00 Individual control system parameters
 - .01.00 Fuel tank
 - .01 Description (include filler inlet, cap, relief valve, vents and anything contained in tank)
 - .02 Calibration of any device on fuel tank such as vents or pressure relief valves
 - .03 Fuel tank material
 - .02.00 Storage device
 - .01 Description
 - .02 Calibration
 - .03.00 Purge system
 - .01 Description
 - .02 Calibration

04.00	Carburetor
.01	Description
.02	Calibration
09.03.05.00	Air cleaner
.01	Description
.06.00	Auxiliary emission control devices
.01	Description
.02	Calibrations
.07,00	Total evaporative emission system configuration

3.10 Engine Family Descriptions (Section 10.00.00.00)

The information submitted determines how the applicant's product line is subdivided into separate engine families.

When an application includes a number of engine families which share common characteristics, referencing should be used to avoid the submission of redundant information. The submission of much of this information may be eliminated by referencing a particular engine family. For example, if a manufacturer wishes to certify families A, B, and C, each of which differ by one or more parameters, the applicant can submit all the required information on engine family A and then submit a single page for engine families B and C with a statement stating that these families are identical to engine family A except for the listed differences.

This concept can be enlarged where certain sections of an engine family may be different but would benefit from the use of referencing. Discretion will have to be used, however, to ensure that this procedure is used in cases where there are few enough differences to make it an effective tool.

Section No.	Title
10.01.00.00	Common family parameters
.01.00	Block configuration
.01	Number of cylinders
.02	Cylinder head configuration (specify OHV, OHV/OHC, etc.)

- .03 Type of cooling (air, water)
- .04 Cylinder arrangement (Inline, 90 Vee, etc.)
- .02.00 Combustion cycle (four-stroke cycle,
 two-stroke cycle, etc.)
- .03.00 Method of aspiration (natural, supercharged,
 etc.)
- .04.00 Type of charge air cooling water-to-air,
 air-to-air, etc.
- .02.00.00 Individual engine parameters (physical)
 - .01.00 Displacement
 - .02.00 Bore and stroke

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- 10.02.03.00 Advertised or rated HP @ RPM* (include fuel
 rate if diesel in lbs/hr and mm3/stroke)
- .04.00 Advertised or rated torque (include fuel rate
 if diesel in lbs/hr and mm3/stroke)
- .05.00 Governed speed RPM (with engine loaded)
- .03.00.00 Individual engine parameters (fuel system)
 - .01.00 Carburetor (gas only)
 - .01 Number of Carburetors
 - .02 Number of venturies per carburetor
 - .03 Calibration and range of adjustment
 - .04 Description
 - .02.00 Fuel Injection
 - .01 Basic Type (e.g., mechanical,
 electronic, timed, continuous)
 - .02 Point of injection (e.g.,
 manifold, throttle body, cylinder,
 precombustion chamber)
 - .03 Calibration and range of adjustment
 - .04 Description
- .04.00.00 Individual engine parameters (Ignition system)
 - .01.00 Basic ignition timing and range of adjustment
 - .02.00 Advance or retard calibration
 - .03.00 Description
- .05.00.00 Individual engine parameters supercharger or
 turbocharger)
 - .01.00 Type (centrifugal, roots, etc.)
 - .02.00 Calibration (if applicable)
- .06.00.00 Individual engine parameter (charge air
 cooler)
 - .01.00 Description

- .02.00 Design Parameters
- .07.00.00 Individual engine parameters (emission control system)
 - .01.00 Crankcase emission control system? (Yes or No?)
 - .01 Description
 - .02 Calibration
 - .02.00 Exhaust emission control system
 - .01 List all emission control systems on engine
 - .02 Description of each emission control system
 - .03 Calibration of each emission control system
 - .03.00 Auxiliary emission control devices (AECD's)
 - .01 List all AECD's used on engine
 - .02 Describe in detail each AECD
 - .03 Calibration of each AECD
 - .04.00 Emission control related warning devices descriptions
- .08.00.00 Transmission usage (manual, automatic, both) (gas engine only)

* Indicate whether net or gross, and specify method of measurement, e.g., 128 BHP @ 4,000 RPM, SAE net.

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- 10.00.00.00 Useful life information (diesel engines only)
 - 01.00 Primary intended service class (light, medium, or heavy)
 - 02.00 Explanation of service class selection
- 10.00.00 Vehicle description (Heavy-duty vehicles certified under the provisions of 40 CFR 86.085-1(b))
 - .01.00 Transmissions
 - .01 Types (M-3, M-4, A-3, etc.)
 - .02 Highest numerical final gear ratio (including overdrive)
 - .02.00 Axles
 - .01 Highest numerical ratio
 - .02 Lowest numerical ratio
 - .03.00 N/V ratio
 - .01 Highest ratio
 - .02 Lowest ratio
 - .04.00 Highest road load power
 - 05 00 Highest equivalent test weight

.06.00 Largest vehicle frontal area

3.11 Reserved (Section 11.00.00.00)

3.12 Test Engine or Vehicle Information (Section 12.00.00.00)

The test engine or vehicle information section should be submitted in a separate loose-leaf binder. Divider pages should be used to separate the test engines. This test engine information will remain in EPA files so that applicants may reference this information across model years when carryover of test engine is desired. Applicants may add test engines or vehicles to this section at anytime during the certification model year or during any later certification model year.

3.12.1 Test Engine or Vehicle Documentation

All test engine or vehicle data must be documented. The required documentation involves the engine or vehicle; engine emissions-related components, such as carburetors and distributors when a gasoline-fueled engine is involved, and fuel injection equipment and turbochargers when diesel engines are involved; all emission control components such as PCV valves, EGR valves, air pumps, catalytic devices, and smoke puff limiters; and auxiliary emission control devices such as timers, delay valves and attenuators. The data which must be recorded include part numbers, serial numbers or other identifying markings, and where applicable, flow curves or the results of other types of performance checks.

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3.12.2 Emission Test Results

The data which are obtained from each emission test that is performed on an emission-data engine or vehicle must be recorded and submitted.

3.12.3 Maintenance Information

All maintenance, scheduled and unscheduled, performed on a certification engine must be recorded.

3.12.4 Engineering Reports

When unscheduled maintenance is performed on a certification engine an engineering report must be submitted.
[Ref: 40 CFR 86.085-25(b)]

3.13 Reserved (Section 13.00.00.00)

3.14 Reserved (Section 14.00.00.00)

3.15 Reserved (Section 15.00.00.00)

3.16 Request for Certificate (Section 16.00.00.00)

3.16.1 Statements

The applicant must provide the statements specified in 40 CFR 86.087-23(d) regarding: (1) conformance with the general standards in 40 CFR 86.084-5 (b)(1), and (3) the availability of the information which demonstrates such conformance (see Advisory Circular No. 76 or 76-1). Also, the manufacturer must submit the statements specified in 40 CFR 86.087-23(e)(1) regarding the configuration and testing of the certification engines or vehicles.

In addition to the above statements:

1. Manufacturers certifying gasoline-fueled heavy-duty vehicles to the evaporative emission standards in 40 CFR 86.087-10(b) must provide the statements specified in 40 CFR 86.087-23(b)(3), (b)(4)(i), (b)(4)(ii) and (e)(2).

2. Manufacturers certifying to the provision of 40 CFR 86.085-1(b) must provide the statements specified in 40 CFR 86.085-23(e)(2).

3. Manufacturers using the provisions of 40 CFR 86.087-10(a)(3)(i) must provide the statements specified in 40 CFR 86.087-23(b)(6)(ii).

The following information must be submitted for each engine or evaporative family:

3.16.2 Deterioration Factor Summary

The deterioration factors, and the data used in their calculation, for each engine-control system combination and evaporative emission control system combination must be submitted. (The summary is not applicable to gasoline-fueled heavy-duty vehicles which are certified to the evaporative emission standards specified in 40 CFR 86.087-10(b).)

3.16.3 Certification Information

The applicable information which is required on pages 8 and 15 of the Appendix must be submitted. The exact form which is used on these pages must be used to facilitate the inclusion of the information into EPA computer data base.

3.16.4 Production Part Numbers

A list of production part numbers needs to be included. A sample form for the presentation of part numbers is shown on page 16 in the Appendix.

3.16.5 Production Engine Parameters

Production calibration data (showing tolerance limits) need to be included for each calibration of carburetor (or fuel injection systems), distributor, automatic choke, AECD, EGR, turbocharger etc., which is available within the product line. Each set of data and calibrations should be identified by:

Heavy-Duty Engines

- a. Engine family
- b. Engine displacement
- c. Engine code
- d. Fuel system

Heavy-Duty Vehicles

- a. Evaporative family
- b. Evaporative system
- c. Evaporative code

Each calibration and set of production tolerance limits shall also indicate (1) any differences from tolerance limits previously included in the application and (2) any special points at which all production pieces are checked and/or adjusted. Applicants should also indicate the percentage of production pieces checked and/or adjusted.

Describe sampling technique, i.e., how "production" tolerances are determined and how tolerance bands are used. For example, a 100 percent check with rejection of all pieces outside of bands; a 2 percent audit of production, or a batch sampling technique.

For any production curve or calibration referenced in this section that is identical in all respects to an engineering curve or calibration previously included in this application, reference to the curve number and latest revision date in this section can be made in lieu of resubmitting the curve or calibration.

Alternatively, the applicant may provide an unqualified statement such as the following, defining the tolerances expected to apply to production vehicles:

This application for certification identifies and describes those vehicles to be covered by the certificate(s) of conformity issued by EPA, and this application for certification covers only those new motor vehicles to be produced by (company name) which conform, in all material respects, to the design specifications (including tolerances) which are contained herein.

CHAPTER 4

Requirements for Small-Volume Applicants

4.1 Introduction

Applicants who obtain the Administrator's approval (40 CFR 86.085-1(e)) to use the small-volume manufacturer certification procedures should submit only the information requested in Subpart 4.2 below. Small-volume applicants are required to prepare and maintain in their files the information listed in the first three chapters of these instructions and any information specified in 40 CFR, Part 86.

4.2 Submission Requirement

Small-volume applicants should submit an application for certification containing the following items [Reference 40 CFR 86.084-14(c)(11)(ii)]:

1. The names, addresses, and telephone numbers of all technical representatives who are authorized to communicate with EPA and the person to whom the certificate should be mailed.
2. The corporate name and engine family name(s) that should appear on the certificate.
3. A brief description of the engines or vehicles covered by certificate (the applicant's sales data book or advertising, including specification, may satisfy this requirement for most manufacturers). The description shall include, as a minimum, the following items as applicable.
 - A. Engine configurations.
 - B. Engine models to be covered by the certificate of conformity.
 - C. Projected sales.
 - D. Engine combustion cycle.
 - E. Engine cooling mechanism.

F. Number of engine cylinders.

G. Engine displacement.

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H. Fuel system type.

I. Number of catalytic converters, volume, and composition.

J. Method of air aspiration.

K. Thermal reactor characteristics (if applicable).

L. Suppliers' and/or manufacturer's name and model number of any emissions related items of the above items if purchased from a supplier who uses the items in its own certified engine(s).

M. A list of emission component part numbers.

N. Drawings, calibration curves, and descriptions of emission related components and schematics of hoses and other devices connecting these components.

O. Vehicle or engine configuration, test weight, and horsepower setting.

4. The results of all emission tests the manufacturer performs to demonstrate compliance with the applicable standards. These test results must be reported on one of the forms which are given on pages 8 and 15 of the Appendix. The exact form which is used on these pages must be used to facilitate the inclusion of the information into EPA computer data base.

5. The following statements signed by the authorized representative of the manufacturer:

A. "The engines described herein have been tested in accordance with the [list of applicable subparts; A, I, N, or P] of Part 86, Title 40, United States Code of Federal Regulations,

and on the basis of those tests are in conformance with that subpart. All of the data and records required by the subpart are on file and are available for inspection by the EPA Administrator. We project the total U.S. sales of engines subject to this subpart to be fewer than 10,000 units."

B. "The engines described herein are not equipped with auxiliary emission control devices which can be classified as a defeat device as defined in section 86.085-2 of this subpart."

C. "The test vehicles with respect to which data are submitted to demonstrate compliance with the standards are in all material respects as described in our application for certification, have been tested in accordance with the applicable test procedures utilizing the fuel and equipment described in the application, and on the basis of such tests the vehicles conform to the requirements of the regulations."

D. "Any element of design, system, or emission control device installed on or incorporated in our new motor vehicles for the purpose of complying with standards prescribed under Section 202 of the Clean Air Act, will not, to the best of our information and belief, cause the emission into the ambient air of pollutants in the operation of our motor vehicles which cause or contribute to an unreasonable risk to public health or welfare except as specifically permitted by the standards prescribed under Section 202 of the Clean Air Act. Any element of design, system, or emission control device installed on or incorporated in our new motor vehicles, for the purpose of complying with standards prescribed under Section 202 of the Clean Air Act, will not, to the best of our information and belief, cause or contribute to an unreasonable risk to public safety. The term "pollutant" means

- (1) Diesel particulates
- (2) Nickel
- (3) MMT combustion products
- (4) Ammonia
- (5) Sulfates
- (6) Hydrogen sulfide
- (7) Hydrogen cyanide
- (8) Ruthenium combustion products
- (9) Nitrosamines

or any other pollutant which we have identified which can reasonably be expected to be emitted from these vehicles."

6. This information should be submitted with a letter of transmittal to:

Director
Certification Division
U.S. Environmental Protection Agency
2565 Plymouth Road
Ann Arbor, MI 48105

A duplicate copy should be submitted to:

Director (EN-340)
Manufacturers Operations Division
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

APPENDIX

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EPA STANDARDIZED FAMILY NAMES

Background

The EPA standardized family names identify the model year and manufacturer and provide essential information regarding each family. The use of the standardized family names facilitates the review process and minimizes errors when the data are entered into the EPA computer data base.

The family names are based on the use of a sequence of letters and numbers which provide the specific items of information. Eleven characters are used for heavy-duty engine families and gasoline-fueled heavy-duty vehicle families as follows:

Character	Heavy-Duty Engine Information Item	Heavy-Duty Vehicle Information Item
1	Model Year (One Letter -Table 1)	Model Year (One Letter -Table 1)
2 & 3	Manufacturer (Two Letters -Table 2)	Manufacturer (Two Letters -Table 5)
4,5,6, & 7	Engine Displacement (Four Digits, examples: 0466 = 466 cubic inches 05.7 -5.7 liters)	Fuel Tank Capacity (Four Digits, example: 0493 = 49.3)
8	Engine Type (One Letter -Table 3)	Tank capacity (G = gallons, L -liters)
9	Emission Control System Vapor Storage System (Letter -Table 4) (One Letter -Table 6)	
10	Uniqueness Digit Uniqueness Digit	
11	Check Sum Digit Check Sum Digit	

The tables referenced in these sequences are presented on pages 4 and 5 of this appendix. Examples of the family names that result from the use of these tables are:

Heavy-duty Engine Family

Heavy-Duty Vehicle Family

HCE0855EPA6

HFM0493GAA7

H = 1987 model year
CE = Cummins Engine Co.
0855 = 855 cubic inches
E = Compression ignition
turbo-charged
P = Smoke puff limiter
A = Uniqueness letter
6 = Check sum digit

H = 1987 Model year
FM = Ford Motor Co
0493 = 49.3
G = Gallons
A = Canister
A = Uniqueness letter
8 = Check sum digit

Twelve characters are used for light-duty truck families as follows:

Character	Information Item
1	Model Year (One letter -Table 1)
2 & 3	Manufacturer (Two Letters -Table 7)
4,5,& 6	Engine displacement (Three digits, examples: 350 = 350 cubic inches; 5.7 = 5.7 liters)
7	Vehicle Class (T = light-duty truck)
8	Fuel System Type (One Letter -Table 8)
9	Catalyst Type (One letter -Table 9)
10	Uniqueness Digit
11	Uniqueness Digit
12	Check Sum Digit

Example: Light-duty truck engine family HAM4.2T2HEA9

H = 1987 Model year
AM = American Motors Corp.
.2 -4.2 liters
T 5 Light-duty truck
2 = Two-barrel carburetor

H = Three-way catalyst with
feedback control of fuel/
air ratio
EA = Uniqueness letters
9 = Check sum digit

Determination of Check-Sum Digit

Step 1. Assign to each number in the sequence its actual mathematical value and assign to each letter the value specified below:

A = 1	J = 1	T = 3
B = 2	R = 2	U = 4
C = 3	L = 3	V = 5
D = 4	M = 4	W = 6
E = 5	N = 5	X = 7
F = 6	P = 7	Y = 8
G = 7	R = 9	Z = 9
H = 8	S = 2	decimal pt = 1

Step 2. Multiply the assigned value for each character in the sequence by the weight factor specified for it below:

Character	Heavy-Duty Engine	Light-Duty Truck
	Heavy-duty Vehicle Weight Factors	
1st	10	
2nd	9	10
3rd	8	9
4th	7	8
5th	6	7
6th	5	6
7th	4	5
8th	3	4
9th	2	3
10th	1	2
11th	NA	

Step 3. Add the resulting products and divide the total by 11. The remainder is the CSD. If the remainder is 10, the CSD is X.
Example: HDE -Determine the CSD if the first 10 characters are HCE0855EPA.

	H	C	E	0	8	5	5	E	P	A
Assigned Value-	8		3		5	0	8	5	5	5
Weighted Value	10		9		8	7	6	5	4	3
Products	80		27		40	0	48	25	20	15

Sum of Products = 270
Divide by 11 = 24 + 6/11
CSD - 6

Therefore, the complete standardized engine family name is
HCE0855EPA6

TABLE 1

Model Year Codes

Year	Code
1987	H
1988	J
1989	K
1990	L
1991	M
1992	N
1993	P
1994	R
1995	S
1996	T

TABLE 2

Heavy-Duty Engine Manufacturer Codes

Code	Manufacturer
BB	Bluebird Body Co.
CT	Caterpillar Tractor Co.
CC	Chrysler Corporation
CE	Cummins Engines Company, Inc.
DT	Daf Truck
DB	Daimler-Benz Aktiengesellschaft
FM	Ford Motor Company

GM	General Motors Corporation
HM	Hino Motors, Ltd.
HC	Navistar International Company
SZ	Isuzu Motors Limited
VE	IVECO Trucks of North America
JD	John Deere
DZ	Klocker-Humboldt-Deutz AG
MT	Mack Truck, Inc.
MA	M.A.N. Maschinenfabrik Augsburg-Nurnberg AG
MM	Mitsubishi Motor Corporation
ND	Nissan Diesel Co., Ltd.
NA	Onan Corporation
RE	Vehicules Industriels
RC	Revcon Incorporated
RM	Roadmaster Rail
SS	Saab-Scania
VT	AB Volvo, Truck Division
WE	White Engines, Inc.

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TABLE 3

Heavy-Duty Engine Type Codes

CODE	Engine Type
A	Spark ignition carbureted engine
B	Spark ignition fuel injected engine
C	Spark ignition turbo-charged engine
D	Compression ignition natural aspirated engine
E	Compression ignition turbo-charged engine
F	Compression ignition turbo-charged and aftercooled or intercooled
Z	Other

TABLE 4

Heavy-Duty Engine Emission Control System Codes

Code	Control System
------	----------------

A	Engine modification
B	Air injection
C	Exhaust gas recirculation
D	Oxidation catalyst
E	Reduction catalyst
F	Three-way catalyst
G	Air injection + exhaust gas recirculation
H	Air injection + oxidation catalyst
J	Air injection + reduction catalyst
K	Air injection + three-way catalyst
L	Exhaust gas recirculation + oxidation catalyst
M	Exhaust gas recirculation + reduction catalyst
N	Exhaust gas recirculation + three-way catalyst
P	Smoke puff limiter
R	Air injection + exhaust gas recirculation + oxidation catalyst
S	Air injection + exhaust gas recirculation + reduction catalyst
T	Air injection + exhaust gas recirculation + Three-way catalyst
Z	Other

TABLE 5

Gasoline-Fueled Heavy-Duty Vehicle Manufacturer Codes

Code	Manufacturer
BB	Bluebird Body Co.
CC	Chrysler Corporation
FM	Ford Motor Company
GM	General Motors Corporation
RC	Revcon Incorporated

TABLE 6

Heavy-Vehicle Evaporative Vapor Storage Device Codes

Code	Vapor Storage Device
A	Canister
B	Crankcase
C	Air cleaner
D	Canister & crankcase
E	Canister & air cleaner
F	Crankcase & air cleaner
G	Canister, crankcase, & air cleaner
Z	Other

TABLE 7

Light-Duty Truck Manufacturer Codes

Code	Manufacturer
CR	Chrysler Corporation
FM	Ford Motor Company
GC	GMC Division

TABLE 8

Light-Duty Truck Fuel System Type Code

Code	Fuel System
0	Multiple carburetors (e.g., four two-barrel
1	1 barrel
2	2 barrel
3	3 barrel
4	4 barrel
5	Electronic fuel injection
6	Mechanical fuel injection
9	Other

TABLE 9

Catalyst Type Codes

Code	Catalyst Type
A	Single oxidation
B	More than one oxidation
C	Single reduction
D	More than one reduction
E	Three-way; no feedback control of fuel/air ratio
F	Three-way with feedback control of fuel/air ratio
G	Three-way plus other catalyst(s) no feedback control of fuel/air ratio
H	Three-way plus other catalyst(s) and feedback control of fuel/air ratio
J	No Catalyst
R	Other

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HEAVY-DUTY DIESEL ENGINE CERTIFICATION INFORMATION SHEET

FAMILY INFORMATION

CORPORATE NAME (MFR):

/_____

EPA STANDARDIZED ENGINE

MFR

FAMILY

FAMILY NAME(5) /___/___/___/___/___/___/___/___/___/___/
NAME_____

MODEL YEAR: /___/___/

NUMBER OF CYLINDER:

. /___/___/

METHOD OF ASPIRATION: (T,N,TA) (1) /___/___/

FUEL SYSTEM (M,

E):(1). /___/___/

FAMILY SALES: /___/___/___/___/___/___/

INTENDED SERVICE CLASS (1)

/___/___/___/___/___/___/ (4)

Useful Life Mileage

CO WAIVER YES-NO /_____/

ENGINE MODELS:(2)

.[_____

ENGINE DISPLACEMENTS (CI or Liters):(2)

[_____

TEST ENGINE INFORMATION

MODEL /_____ /

/_____ /

DISPLACEMENT (CI or
liters) /___/___/___/___/

/___/___/___/___/

EMISS CNTRL SYS(1). . . . /___/___/___/-/___/___/___/-/___/___/___/

/___/___/___/-/___/___/___/-/___/___/___/

ENG CODE. /_____ /

/_____ /

RATED HP @ ENG SPEED. . . /___/___/___/@/___/___/___/___/

/___/___/___/@/___/___/___/___/

RATED TORQUE @ ENG SPEED. /___/___/___/___/@/___/___/___/___/

/___/___/___/___/@/___/___/___/___/

ENGINE ID NUMBER. /_____ /

/_____ /

OFFICIAL TEST RESULTS: (Exhaust Emissions)

TEST NUMBER:. /_____ /

/_____ /

TEST TYPE /_____ /

/_____ /

HC (gm/bhp-hr) /___/.__/___/

/___/.__/___/

CO (gm/bhp-hr) /___/___/.__/___/

/___/___/.__/___/

NOx (gm/bhp-hr) /___/___/.__/___/

/___/___/.__/___/

Particulate (gm/bhp-hr) (3) /___/.__/___/___/

/___/.__/___/___/

DETERIORATION FACTORS: (Exhaust Emissions)

HC (DF) /___/___/.__/___/

/___/___/.__/___/

CO (DF) /___/___/.__/___/

/___/___/.__/___/

NOx (DF) /__/_/.__/_/
/__/_/.__/_/
Particulate (DF)(3) . . . /__/_/.__/_/
/__/_/.__/_/
DF Type (A,M)(1) /__/_/

CERTIFICATION LEVELS: (Exhaust Emissions)
HC (gm/bhp-hr). /__/_/.__/_/
/__/_/.__/_/
CO (gm/bhp-hr). /__/_/.__/_/
/__/_/.__/_/
NOx (gm/bhp-hr) /__/_/.__/_/
/__/_/.__/_/
Particulate (gm/bhp-hr) (3) /__/_/.__/_/
/__/_/.__/_/

CORPORATE NAME (MFR): . . . /_____
ENGINE FAMILY NAME: . . . /__/_/___/___/___/___/___/
MODEL YEAR: /__/_/

TEST ENGINE INFORMATION

OFFICIAL TEST RESULTS: (Smoke Emissions)
TEST NUMBER:. /_____
/_____
ACCELERATION (%). . . /__/_/.__/_/
/__/_/.__/_/
LUG (%) /__/_/.__/_/
/__/_/.__/_/
PEAK (%). /__/_/.__/_/
/__/_/.__/_/

DETERIORATION FACTORS: (Smoke Emissions)
ACCELERATION (DF) . . /__/_/.__/_/
/__/_/.__/_/
LUG (DF). /__/_/.__/_/
/__/_/.__/_/
PEAK (DF) /__/_/.__/_/
/__/_/.__/_/
CERTIFICATION LEVELS: (Smoke Emissions)
ACCELERATION (%). . . /__/_/.__/_/

/__/_/.__/
 LUG (%) /__/_/.__/
 /__/_/.__/
 PEAK (%) /__/_/.__/
 /__/_/.__/

COMMENTS: _____

(1) Codes: Aspiration:	DF Type
Fuel System:	
N -Natural	A-Additive
M -Mechanical	
T -Turbo-charged	M-Multiplicative
E -Electronic	
TA -Turbo-charged	
Aftercooled	

Emission Control System:
 Intended Service Class

EM -Engine Modification	Test Type
Light	
EGR -Exhaust Gas Recirculation	Cold Start
Medium	
SPL -Smoke-Puff-Limiter	Hot Start
Heavy	
TR -Trap	

- (2) Separate each model or displacement with a semicolon (;)
- (3) Applies to 1988 and later model years.
- (4) If different than EPA defined mileage.
- (5) Both EPA standardized engine family name and MFR engine family name must be filled - when
- MFR does not use EPA standardized engine family name in the

application.

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HEAVY-DUTY GAS ENGINE CERTIFICATION INFORMATION SHEET

FAMILY INFORMATION

CORPORATE NAME (MFR):

/

EPA STANDARDIZED ENGINE

MFR

FAMILY

FAMILY NAME(3) /_/_/_/_/_/_/_/_/_/_/_/

NAME _____

MODEL YEAR: /_/_/

NUMBER OF CYLINDER:

. /_/_/

METHOD OF ASPIRATION:(T,N,TA)(1) /_/_/

FUEL SYSTEM (CB,

FI):(1). /_/_/

FAMILY SALES: /_/_/_/_/_/_/

ENGINE INTENDED VEHICLE

USAGE (1, 2, 3)(1) /_-/_/

ENGINE MODELS:(2)

. [_____

ENGINE DISPLACEMENTS (CI or Liters):(2)

[_____

TEST ENGINE INFORMATION

MODEL / _____/

/ _____/

DISPLACEMENT (CI or

liters) /_/_/_/_/

/_/_/_/_/

EMISS CNTRL SYS(1). /_/_/_-/_/_/_/_/_/_/

/_/_/_-/_/_/_/_/_/_/_/

ENG CODE. / _____/

/ _____/

NUMBER OF CARBS -

VENTURIES /_-_-/_/_V_/

/__/_-_/__/_V_/
RATED HP @ ENG SPEED. . . /__/_/_/@/_/_/_/_/_/
/__/__/_/@/_/_/_/_/_/
RATED TORQUE @ ENG SPEED. /__/_/_/_/_/ @ /__/_/_/_/_/_/
/__/__/_/_/_/ @ /__/_/_/_/_/_/
ENGINE ID NUMBER /_____/
/_____/

OFFICIAL TEST RESULTS:
TEST NUMBER:. . . . /_____/
/_____/
HC (gm/bhp-hr). . . . /__/_._/_/_/
/__/_._/_/_/
CO (gm/bhp-hr). . . . /__/_/_._/_/_/
/__/_/_/_._/_/_/
NOx (gm/bhp-hr) . . . /__/_/_._/_/_/
/__/_/_/_._/_/_/
Idle CO (Percent) . . /__/_._/_/_/_/
/__/_._/_/_/_/

DETERIORATION FACTORS:
HC (DF) /__/_/_._/_/_/
/__/_/_/_._/_/_/
CO (DF) /__/_/_._/_/_/
/__/_/_/_._/_/_/
NOx (DF). /__/_/_._/_/_/
/__/_/_/_._/_/_/
Idle CO (DF). /__/_/_._/_/_/
/__/_/_/_._/_/_/
DF Type (A,M)(1). . . /___/ /___/

CERTIFICATION LEVELS:
HC (gm/bhp-hr). . . . /__/_._/_/_/
/__/_._/_/_/
CO (gm/bhp-hr). . . . /__/_/_._/_/_/
/__/_/_/_._/_/_/
NOx (gm/bhp-hr) . . . /__/_/_._/_/_/
/__/_/_/_._/_/_/
Idle CO (Percent) /__/_._/_/_/_/
/__/_._/_/_/_/

(1) Codes: Aspiration:
Fuel System:

DF Type

N -Natural	A-Additive	CB
-Carburetor		
T -Turbo-charged	M-Multiplicative	FI
-Fuel Injection		
TA -Turbo-charged		
Aftercooled		

Emission Control System: Engine
Intended Vehicle Usage

EM -Engine Modification	1	
-86.087-10(a)(1)(i)--All		
AIR -Air Injection	2	
-86.087-10(a)(1)(ii)--Greater		
EGR -Exhaust Gas Recirculation		than
14,000 GVWR		
CAT -Catalyst	3	
-86.087-10(a)(3)(1)--5% option		

(2) Separate each model or displacement with a semicolon (;)

(3) Both EPA standardized engine family name and MFR engine family name must be filled out when

MFR does not use EPA standardized engine family name in the application.

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FAMILY INFORMATION

CORPORATE NAME (MFR):

./_____

EPA EVAPORATIVE FAMILY NAME(2)./___/___/___/___/___/___/___/___/ MFR FAMILY
/_____

NAME

MODEL YEAR:/___/___/

FAMILY SALES:/___/___/___/___/___/___/

VEHICLE MODELS COVERED:(1)

.[_____

METHOD OF VAPOR STORAGE(1):.

.[_____

EVAPORATIVE INFORMATION

EVAP. CNTRL SYS:. /___/___/___/___/___/___/___/___/___/___/
/___/___/___/___/___/___/___/___/___/___/

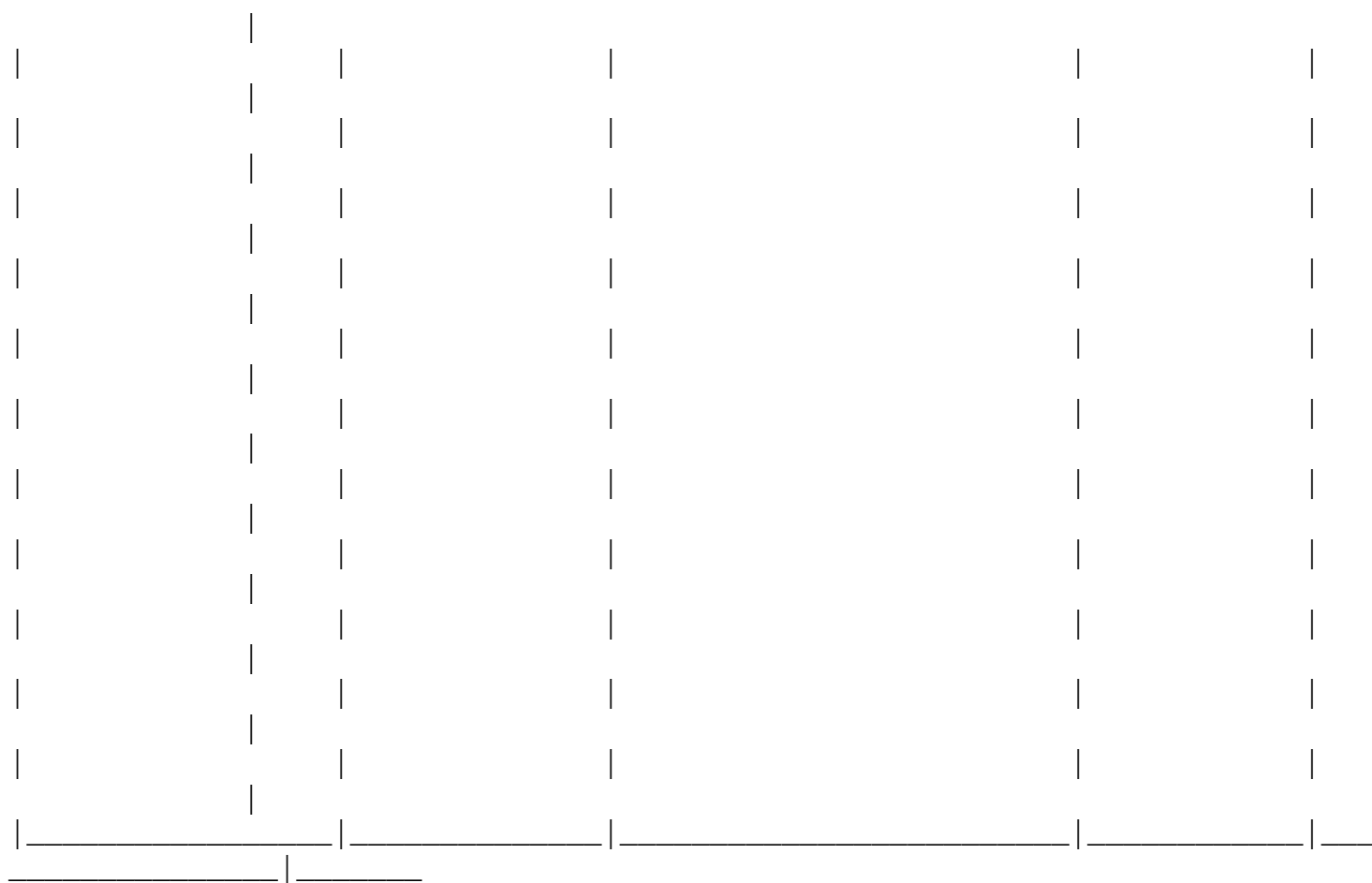
	Min	Max	Min	Max
GVWR FOR SYSTEM	/___/___/___/___/___/	-/___/___/___/___/___/		
	/___/___/___/___/___/	-/___/___/___/___/___/		
DETERIORATION FACTORS:.	/___/.___/___/		/___/.___/___/	

- (1) Separate each model or method of vapor storage with a semicolon(;).
(2) Both the EPA standardized engine family name, and the manufacturer's engine family name must

be shown when the EPA standardized engine family name is not used in the application.

Evaporative Family/Engine Family Comparison
Evaporative Family

[illegible]



WEIGHT (lbs) /__/_/_/_/_/
 ACTUAL DYNO HP /__/_./__/_/
 N/V /__/_./__/_/

OFFICIAL TEST RESULTS:

TEST NUMBER: / _____ /

HC (gm/mi) / __. / __ / __ /

CO (gm/mi) / __ / __. / __ /

NOx (gm/mi) / __. / __ / __ /

Idle CO (%) / __. / __ / __ /

Evaporative HC (gm/Test) / __. / __ / __ /

DETERIORATION FACTORS:

HC (DF)	/__./__./__./__./
CO (DF)	/__./__./__./__./
NOx (DF).	/__./__./__./__./
Idle CO (DF)	/__./__./__./__./
Evaporative HC (DF) .	/__./__./

CERTIFICATION LEVELS:

HC (gm/mi)	/__./__./__./
CO (gm/mi)	/__./__./
NOx (gm/mi)	/__./__./__./
Idle CO (%)	/__./__./__./
Evaporative HC (gm/test)		/__./__./__./

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COMMENTS: _____

(1) Codes: Aspiration:

N -Natural
T -Turbo-charged
TA -Turbo-charged
Aftercooled

Fuel System:

CB -Carburetor
FI -Fuel Injection

Exhaust Emission Control Systems:

AIR = Air injection
 CAI = closed-loop air injection
 CLS = closed loop systems
 EGR = exhaust gas recirculation
 EM = engine modification
 EGR = exhaust gas recirculation
 OTR = other
 OXD = oxidation catalyst
 RED = reduction catalyst
 THM = thermal reactor
 3CL -three-way catalyst + closed loop
 3WY = three-way catalyst

Evaporative Emission Control System:

CAC = carbon air cleaner storage
 CAN = carbon canister storage
 CRK = crankcase storage
 NON = none
 OTR = other
 TNK = tank

(2) Separate each model or displacement with a semicolon (;)

(3) Both EPA standardized engine family name and MFR engine family name must be filled out ??

MFR does not use EPA standardized engine family name in the application.

PRODUCTION ENGINE PARAMETERS

Part Numbers	Engine Code	Engine Code	Engine Code
Fuel pump part number	_____	_____	_____
Carburetor assembly part number	_____	_____	_____
Fuel injection control unit/injection pump part number	_____	_____	_____
Spark plug/fuel injector identification number	_____	_____	_____
Alternate spark plug and heat range	_____	_____	_____
Distributor assembly part number	_____	_____	_____
Turbocharger part number	_____	_____	_____

Supercharger part number	_____	_____	_____
Smoke Puff Limiter part number	_____	_____	_____
Crankcase emission control system-- component part number	_____	_____	_____
Evaporative emission canister part number (if applicable)	_____	_____	_____
Auxiliary emission control devices - identification (color, production code, number, etc.) of calibrated components	_____	_____	_____
Air injection system:			
Air pump part number	_____	_____	_____
Diverter valve part number	_____	_____	_____
Check valve part number	_____	_____	_____
Pressure relief valve part number	_____	_____	_____
Exhaust gas recirculation system:	_____	_____	_____
EGR valve	_____	_____	_____
Amplifier	_____	_____	_____
Modulator	_____	_____	_____
Delay valve	_____	_____	_____
Catalyst assembly part number	_____	_____	_____
Other major exhaust emission control system-part number(s) of calibrated components(s)	_____	_____	_____
Emission control related warning system-- part number(s) of calibrated components(s)	_____	_____	_____